

CLAIMS

What is claimed is:

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1. An isolated nucleic acid encoding a polypeptide having thermostable cellulase activity, which polypeptide is a variant of a glycosyl hydrolasae of family 12, and wherein said nucleic acid is truncated such that one or more of the amino acid residues corresponding to position one to about position 40 in the corresponding full lenght enzyme are deleted in the polypeptide encoded by said nucleic acid.
 2. A construct comprising the nucleic acid of Claim 1 operably linked to a regulatory sequence. 10
 3. A host cell comprising the construct of Claim 2.
 4. An isolated nucleic acid encoding a polypeptide having thermostable cellulase activity, wherein said polypeptide comprises the amino acid sequence of SEQ ID NO:2 wherein one or more of the amino acid residues from position one to about position 40 are deleted. 15
 5. A construct comprising the nucleic acid of Claim 4 operably linked to a regulatory sequence.
 6. A host cell comprising the construct of Claim 5.

7. An isolated nucleic acid encoding a polypeptide having thermostable cellulase activity, said nucleic acid having a nucleotide sequence selected from the group consisting of:
nucleotides 52-783 of SEQ ID NO:3, nucleotides 55-783 of SEQ ID NO:3,
5 nucleotides 58-783 of SEQ ID NO:3, nucleotides 61-783 of SEQ ID NO:3,
nucleotides 64-783 of SEQ ID NO:3, nucleotides 67-783 of SEQ ID NO:3,
nucleotides 70-783 of SEQ ID NO:3, nucleotides 73-783 of SEQ ID NO:3,
nucleotides 76-783 of SEQ ID NO:3, nucleotides 79-783 of SEQ ID NO:3 and
nucleotides 82-783 of SEQ ID NO:3.
- 10 8. A construct comprising the nucleic acid of Claim 7 operably linked to a regulatory sequence.
9. A host cell comprising the construct of Claim 8.
10. The isolated nucleic acid of Claim 7 wherein the nucleic acid has the sequence of nucleotides 52-783 of SEQ ID NO:3.
- 15 11. An isolated nucleic acid encoding a polypeptide having thermostable cellulase activity, said nucleic acid having a nucleotide sequence selected from the group consisting of: nucleotides 85-783 SEQ ID NO:3,
nucleotides 88-783 of SEQ ID NO:3, nucleotides 91-783 of SEQ ID NO:3,
nucleotides 94-783 of SEQ ID NO:3, nucleotides 97-783 of SEQ ID NO:3,
20 nucleotides 100-783 of SEQ ID NO:3, nucleotides 103-783 of SEQ ID NO:3,
nucleotides 106-783 of SEQ ID NO:3, nucleotides 109-783 of SEQ ID NO:3 and
nucleotides 112-783 of SEQ ID NO:3.
- Initials A/CW*

12. A construct comprising the nucleic acid of Claim 11 operably linked to a regulatory sequence.
13. A host cell comprising the construct of Claim 12.
14. The isolated nucleic acid of Claim 11 wherein the nucleic acid comprises the sequence of nucleotides 112-783 of SEQ ID NO:3.
15. An isolated nucleic acid encoding a fusion protein comprising a thermostable cellulase and a fusion partner, said thermostable cellulase is a variant of a glycosyl hydrolysae of family 12, and wherein said nucleic acid is truncated such that one or more of the amino acid residues corresponding to position one to about position 40 in the corresponding full lenght cellulase are deleted in the fusion protein encoded by said nucleic acid.
16. The isolated nucleic acid of claim 15 encoding a fusion protein comprising a thermostable cellulase and a fusion partner, said thermostable cellulase comprising the amino acid sequence of SEQ ID NO:2 wherein said one or more of the amino acid residues from position one to about position 40 are deleted.
17. A construct comprising the nucleic acid of Claim 15 operably linked to a regulatory sequence.
18. A host cell comprising the construct of Claim 17.
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19. A method for producing a thermostable cellulase comprising maintaining the host cell of Claim 18 under conditions suitable for expression of said construct, whereby said thermostable cellulase is produced.

20. The method of Claim 19 further comprising recovering said thermostable cellulase.

21. A method for producing a thermostable cellulase comprising maintaining the host cell of Claim 9 under conditions suitable for expression of said construct, whereby said thermstable cellulase is produced.

10 22. The method of Claim 21 further comprising recovering said thermostable cellulase.

15 23. A method for producing an active variant of a glycosyl hydrolase of family 12 in a bacterial host, wherein said glycosyl hydrolase comprises an amino terminal hydrophobic region and a catalytic domain that are linked by a linker moiety, and said variant has the amino acid sequence of said glycosyl hydrolase wherein one or more of the amino acid residues in said amino terminal hydrophobic region and/or linker moiety are deleted, the method comprising:

- 20 a) providing a bacterial host cell comprising a nucleic acid construct encoding said variant; and
b) maintaining said bacterial host cell under conditions suitable for expression of said active variant.

24. The method of Claim 23 wherein said bacterial host is *E. coli*.

25. The method of Claim 23 wherein said construct comprises an isolated nucleic acid encoding a glycosyl hydrolase wherein the amino terminal hydrophobic region is deleted.
- 5 26. The method of Claim 23 wherein said construct an isolated nucleic acid encoding a glycosyl hydrolase wherein the amino terminal hydrophobic region and the linker moiety is deleted.
27. The method of Claim 23 wherein said glycosyl hydrolase is thermostable.
- 10 28. The method of Claim 23 wherein said glycosyl hydrolase is derived from a species selected from the group containing *Rhodothermus marinus*, *Rhodothermus obamae*, *Rhodothermus obamensis*, *Pyrococcus abyssi*, *Pyrococcus endeavori*, *Pyrococcus furiosus*, *Pyrococcus horikoshi*, *Pyrococcus shinkai*, and *Pyrococcus woesei*.
29. The method of Claim 23 wherein said glycosyl hydrolase of family 12 is Cel12A of *Rhodothermus marinus*.

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